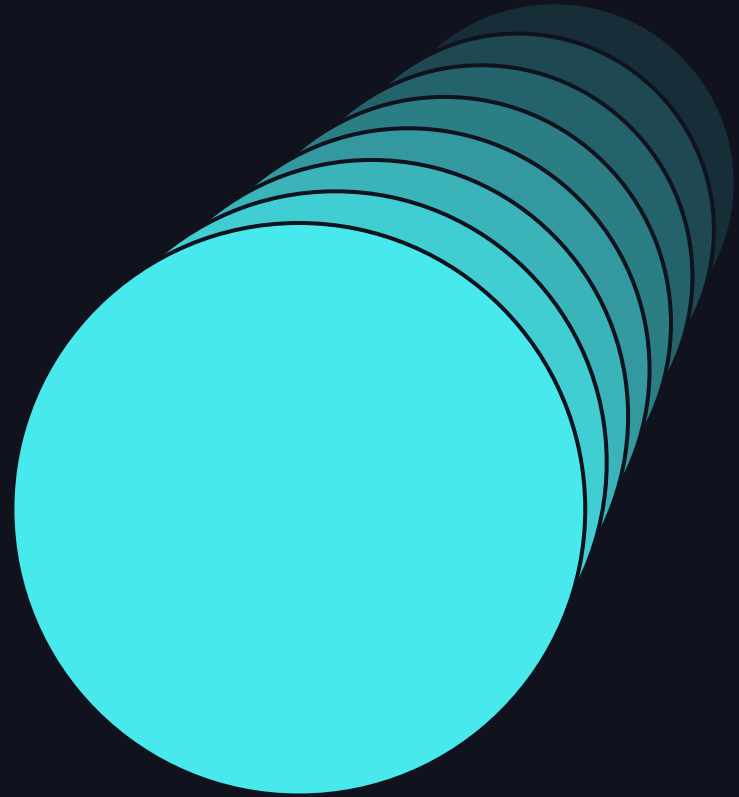


# Crafting Worlds: Generative AI @ SEGA

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Brand Creative Team  
Last updated January 2024



**SEGA**



**Stanley Wang**

Senior Data Scientist

 **databricks**



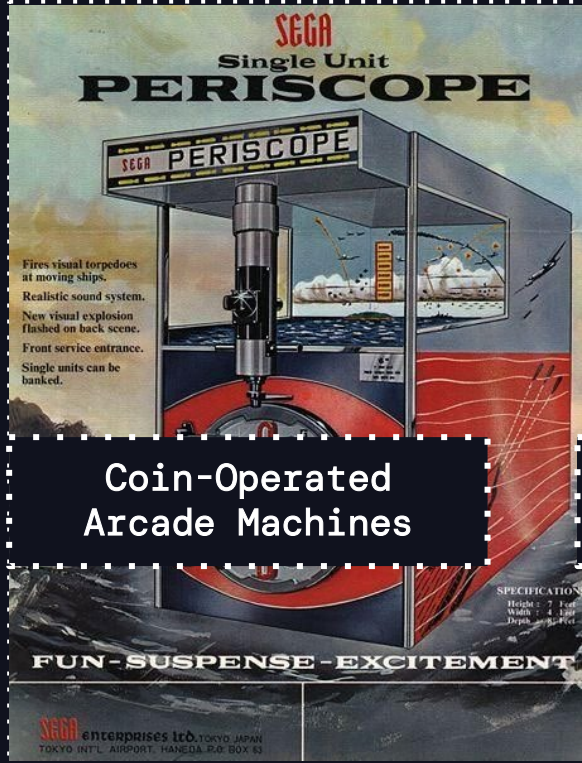
**Maria Zervou**

Senior Specialist  
Solutions Architect

# Agenda

- SEGA History
- Why Gen Ai?
- Our Use Case
- Approach
- Experiments
- Learning
- Next Steps

# SEGA (A brief history)...



Coin-Operated  
Arcade Machines



Entering The  
Console Market



Iconic Franchises

...and now to SEGA Europe



TOTAL WAR™



YAKUZA™



ENDLESS™  
DUNGEON



TWO POINT™  
HOSPITAL



SONIC™  
THE HEDGEHOG



P5  
PERSONA 5

# Why GenAI?



# How has the games industry evolved?



All Games > Strategy Games > Total War Official Franchise > Total War: SHOGUN 2

## Total War: SHOGUN 2

Community Hub



Total War: SHOGUN 2 is the perfect mix of real-time and turn-based strategy gaming for newcomers and veterans alike.

RECENT REVIEWS: Very Positive (257)  
ALL REVIEWS: Very Positive (32,023) \*

RELEASE DATE: 14 Mar, 2011

DEVELOPER: CREATIVE ASSEMBLY, Feral Int...  
PUBLISHER: SEGA, Feral Interactive (Mac), Fo...

Popular user-defined tags for this product:  
[Strategy](#) [Historical](#) [Turn-Based Strategy](#) [RTS](#) +

[Add to your wishlist](#) [Follow](#) [Ignore](#)

[View Your Queue](#)

Check out the entire Total War Official franchise on Steam

Buy Total War: Shogun 2   

£24.99 [Add to Cart](#)

Is this game relevant to you?

This game doesn't look like other things you've played in the past. As such we don't have much information on whether or not you might be interested in it

# What are the challenges?

## 🎮 Innovation vs. Time.

These pressures demand a solution that can support an artists' role.

## 🎮 Replication of Artistic Styles.

Learn the characteristic art themes of the wide range of SEGA titles.

## 🎮 Need for Fast Experimentation.

Support for fast exploration of ideas in the creative phase.





# GenAI as a creative catalyst

## 🎨 Style Consistency.

Ensures artistic integrity across all distinct titles.

## 🎨 Inspiration Tool.

Designed to fuel creativity not replace it.

## 🎨 Concept Development.

Aids in visualizing and refining ideas in the storyboard process.



# Commitment to artistic integrity

## 🎨 AI Assistant.

Enhances the creative process and helps improve artist efficiency.

## 🎨 Human Touch.

Artists expand, refine, and develop AI concepts into assets.

## 🎨 No Direct Use.

AI outputs are for concept development only.



# Example Use Case

# The inspiration

Waikato District in New Zealand





# Interpretations of the base image

## Waikato District in New Zealand





# Evaluation of interpretations

## Waikato District in New Zealand



Painterly aesthetic **enhances** the magical otherworldly feel to the environment.

Impressionistic style **may not be enough** for those who prefer **clear and crisp graphics**.

# Evaluation of interpretations

## Waikato District in New Zealand



Stylized and elegant **aesthetic** to the game **in line** with more graceful factions.

The intricate and decorative elements of Art Nouveau **may not translate well** to more **rugged and war torn environments**.

# In-house recreation into asset

## New Zealand Waikato Region



# Total War: Three Kingdoms





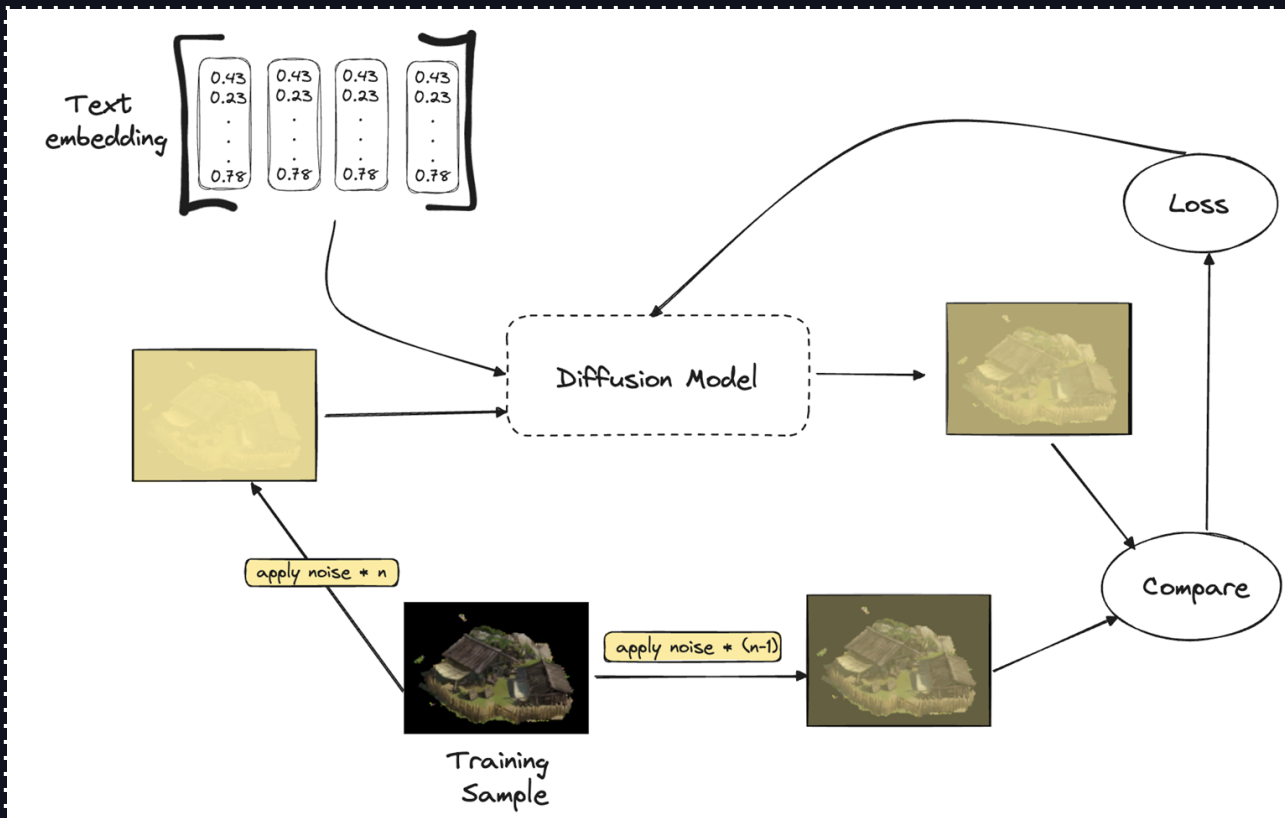
TOTAL WAR   
 **THREE KINGDOMS**



# Approach

"It's like a photo booth, but once the subject is captured, it can be synthesized **wherever your dreams take you.**"

# How Dreambooth works



# To train Dreambooth you need

Images, Unique ID and Class

Image



A couple of images from each class

# To train Dreambooth you need

Images, Unique ID and Class

Image



Prompt

A yellow turban building level 2



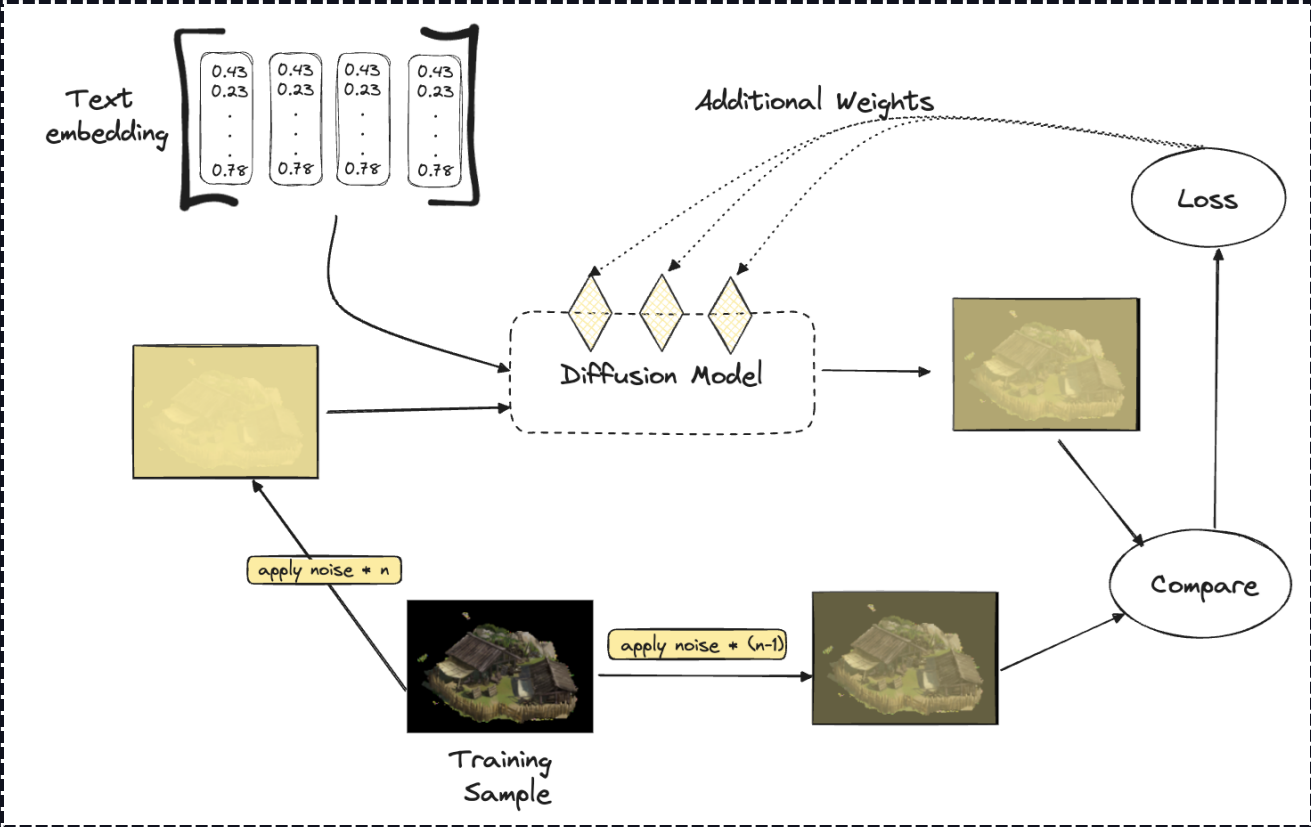
Unique id



Class



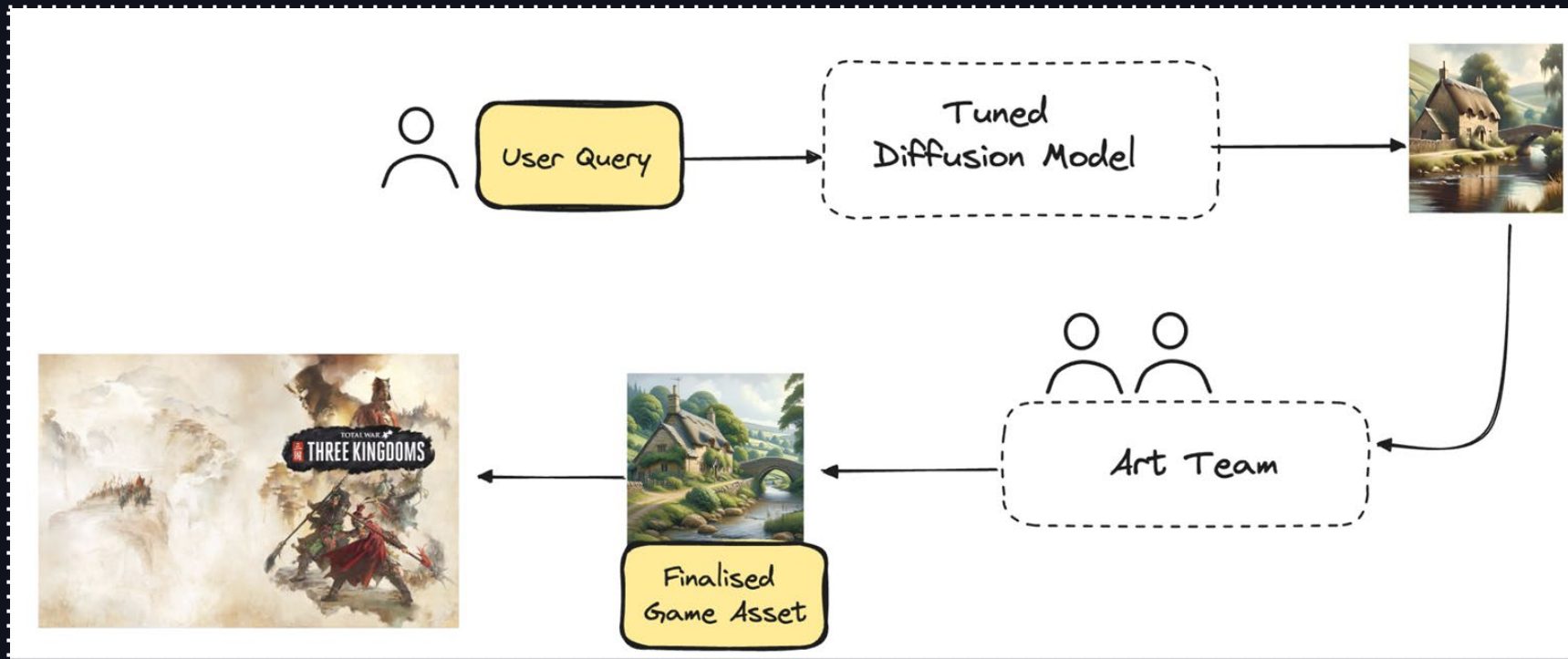
# Loras



# Experiments

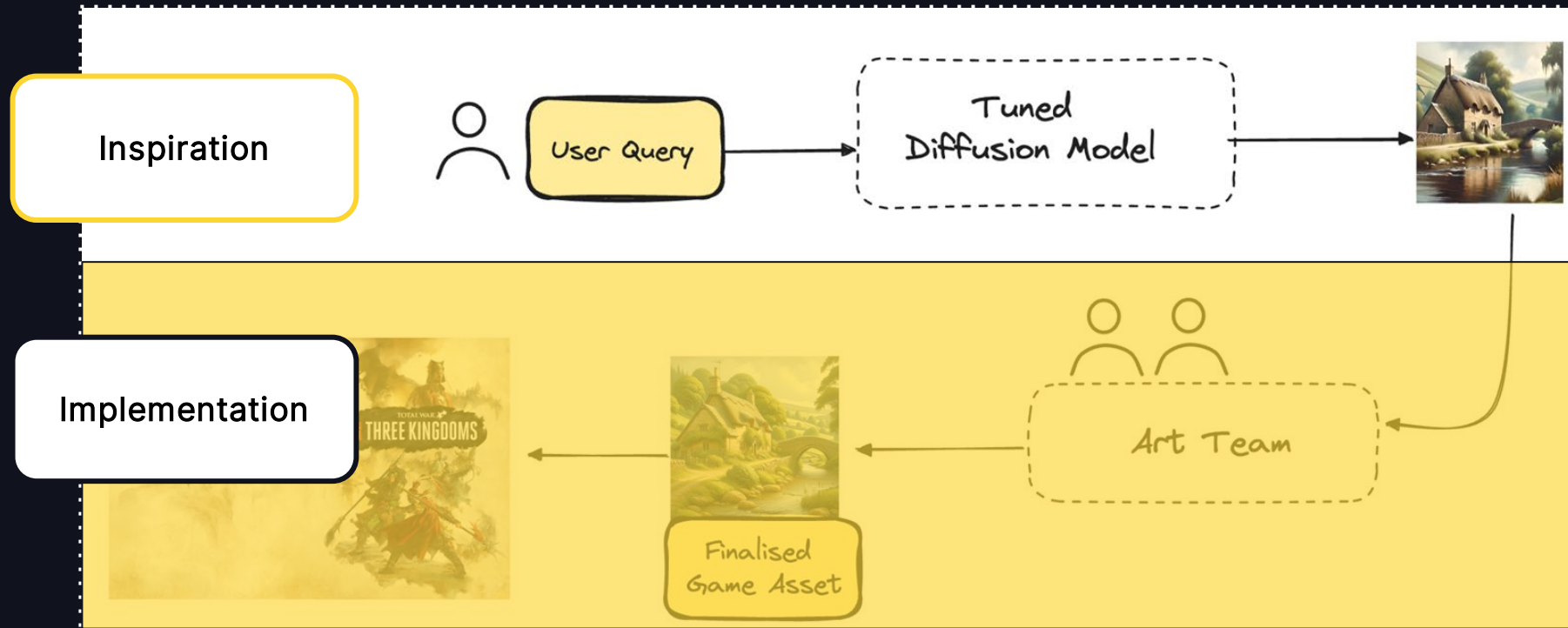
# Remember, Human in the Loop

The designers finalise the assets



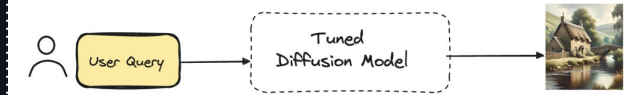
# Focus of the talk

## Model Tuning



# Experiment 1

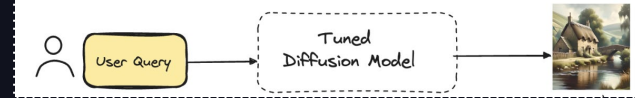
## Yellow Turban Original Data in the training set





# Experiment 1

## Baseline - Model with NO fine tuning

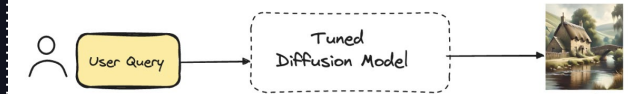


“An image of yellow turban gardens in the three kingdoms period of China”

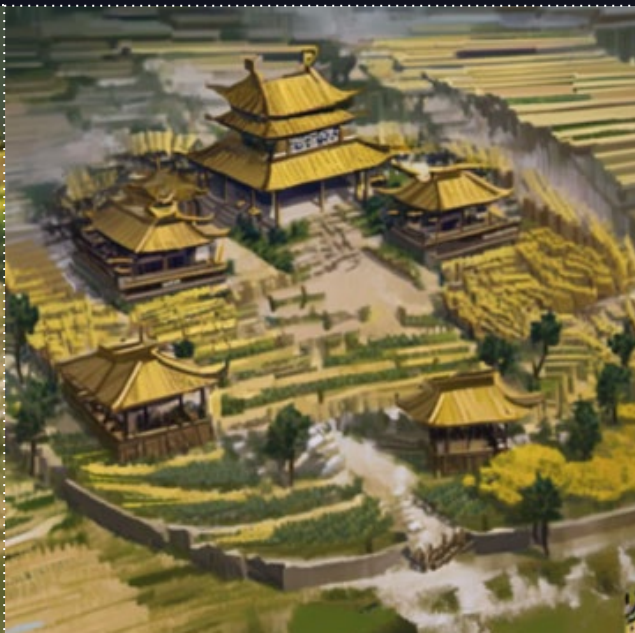
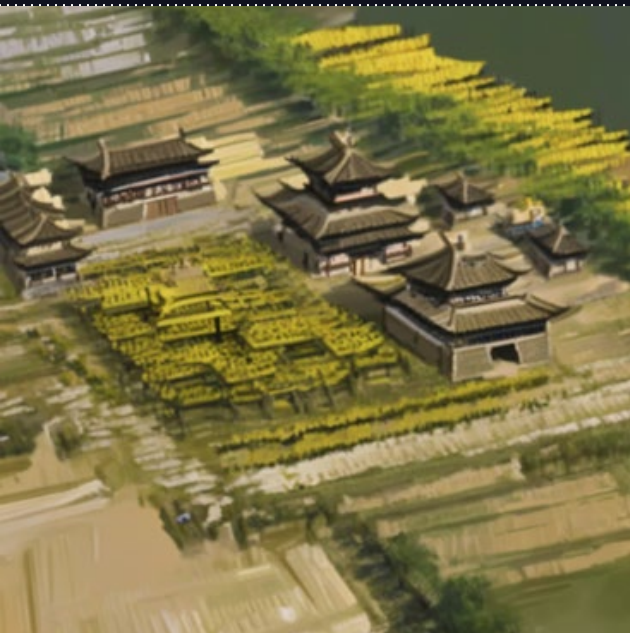


# Experiment 1

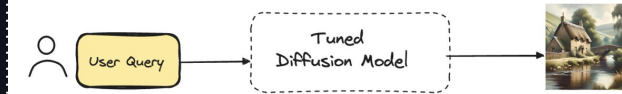
## Fine Tuned Model on Yellow Turban data



“An image of yellow turban gardens in the three kingdoms period of China”



# Experiment 2



## Yellow Turban Original Data in the training set with Levels



Level 1



Level 2



Level 3



Level 4



Level 5



Level 1



Level 2



Level 3

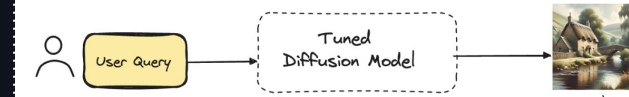


Level 4



Level 5

# Experiment 2



Fine Tune Model on Yellow Turban data and let it understand the different levels?

“An image of yellow turban gardens in the three kingdoms period of China Level 1”



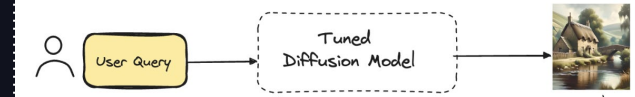
Model with NO fine tuning



Model with fine tuning



# Experiment 2



Fine Tune Model on Yellow Turban data and let it understand the different levels?

“An image of yellow turban gardens in the three kingdoms period of China Level 4”



Model with NO fine tuning

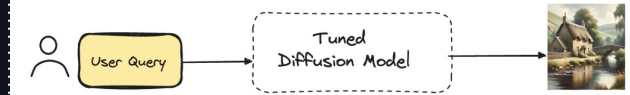


Model with fine tuning



# Experiment 3

## Detailed data annotation / Manual



- "3k\_district\_yellow\_turban\_artisan\_workshop\_1"
- "3k\_district\_yellow\_turban\_gardens\_1"

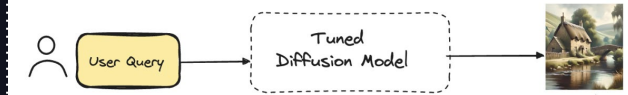
No manual annotation

- "Yellow Turban Rebellion - Economic Building - Lucky Knot Weavery"
- "Yellow Turban Rebellion - Government Building - Quiet Garden"

Manual annotation

# Experiment 3

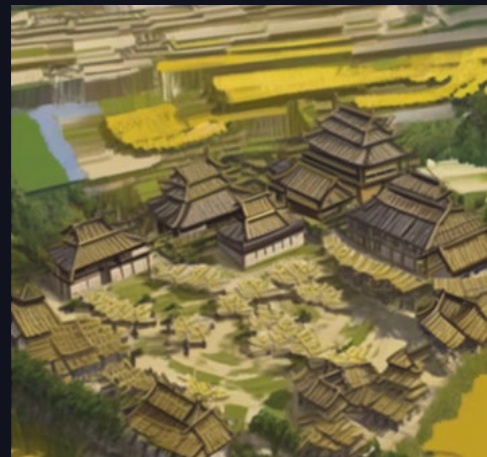
## Detailed data annotation / Manual



“An image of yellow turban gardens in the three kingdoms period of China”



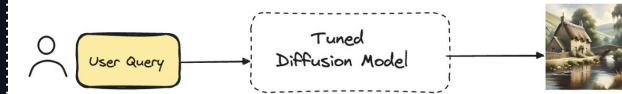
No manual annotation



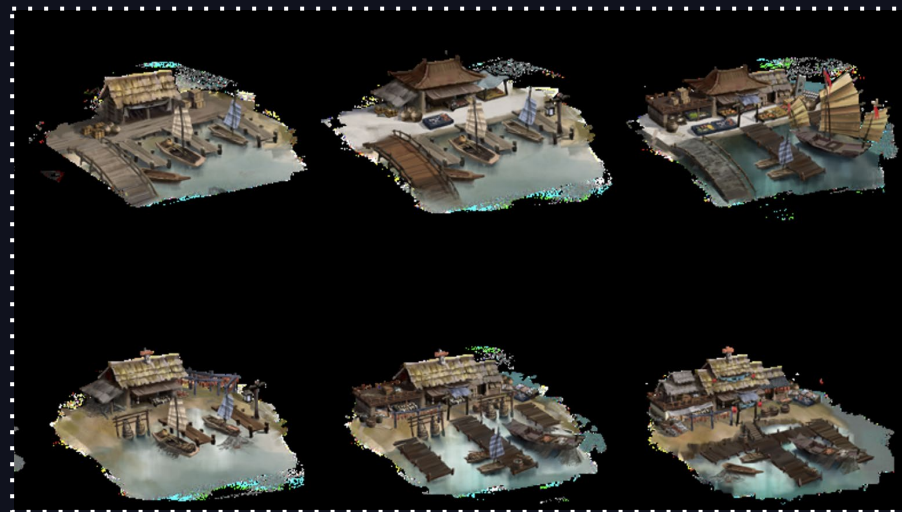
Manual annotation

# Experiment 4

## Single Group Models vs Combined



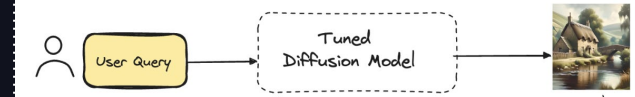
Yellow Turbans  
Buildings



Fish Markets

# Experiment 4

## Benchmark - Not Tuned Model

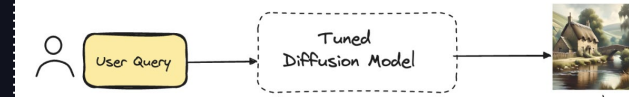


An image of a fish market in the three kingdoms period of China

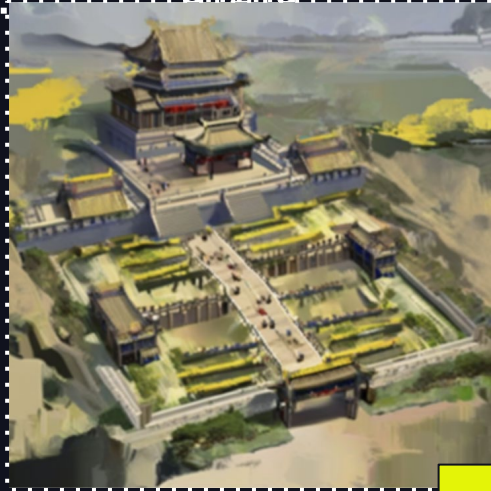


# Experiment 4

## Single Group Models vs Combined



“An image of yellow turban gardens in the three kingdoms period of China”



Yellow Turban Model

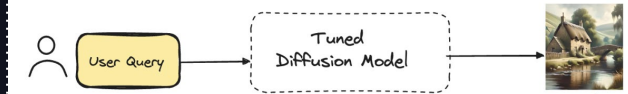
“An image of a fish market in the three kingdoms period of China”





# Experiment 4

## Market only Tuned Model



An image of a fish market in the three kingdoms period of China

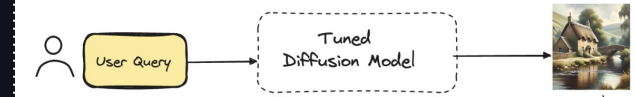


Fish Market Model



# Experiment 4

## Market only Tuned Model



An image of yellow turban gardens in  
the three kingdoms period of China

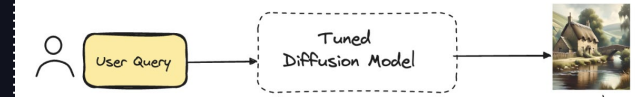


Fish Market Model



# Experiment 4

## Single Group Models vs Combined



“An image of yellow turban gardens in the three kingdoms period of China”



“An image of a fish market in the three kingdoms period of China”



# Learnings



# What did we learn - Data Side

## Images



**Quality** of data and  
**resolution** matters!



# What did we learn - Data Side

## The accompanied to image prompt



Quality of data and resolution matters!

Image



Prompt

A yellow turban building level 2

Choose the unique id wisely

# Dreambooth

## The unique Id

- "man" is a common token, and Stable Diffusion has a lot of ideas for what it means.
- 'sks' is a rare token, so Stable Diffusion has very little idea of what it might mean.

Rare tokens gives you a blank state and more control over the training.

## Prompt

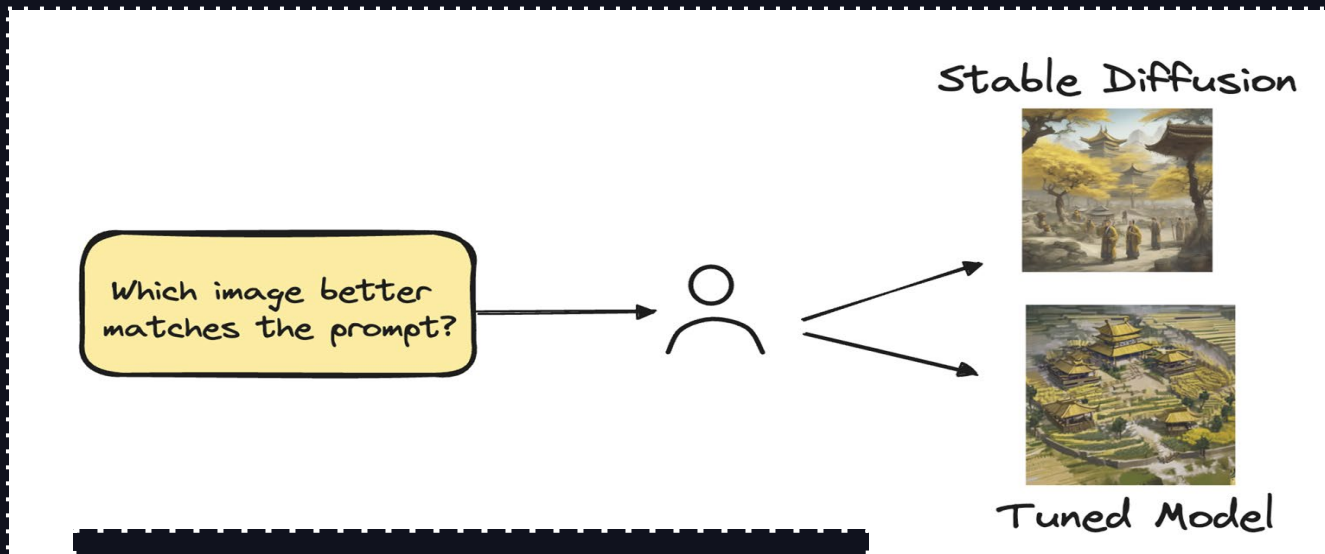
A yellow turban building level 2

# Manual Annotation and Prompt Size



# What did we learn

## Evaluation



**Evaluating** image generation models is difficult

# Future Work



# What are our future goals?

- ✓ **Continual Improvement.**

Focus on enhancing the model's grasp of artistic nuances.

- ✓ **Training and Refinement.**

Implement training using diverse datasets and artist feedback.

- ✓ **Expanding Applications.**

Explore potential in other areas such as character and environment.



# What are our future goals?

## ☑ Data Governance.

Introduce more control over the data that goes into training.

## ☑ ImageAI.

Replace Stable Diffusion model for more trusted outputs.

## ☑ Leadership.

Aim to position SEGA as a pioneer in AI-driven game development.



# DATA+AI SUMMIT

Stanley Wang



Maria Zervou



Thank You!